

WE CLAIM:

1. A medical device for insertion into a bodily vessel to treat an aneurysm having an aneurysm neck, the device comprising:
 - 5 a mechanically expandable device expandable from a first position to a second position, said mechanically expandable device is expanded radially outwardly to the second position such that the exterior surface of said mechanically expandable device engages with the inner surface of the vessel so as to maintain a fluid pathway through said vessel;
 - 10 a therapeutically effective amount of a chemical compound comprising a biosynthesis accelerator to stimulate cell growth; and
a polymer mixed with the chemical compound to manage the release rate of the chemical compound;
wherein the mechanically expandable device provides a support for the
15 release of the chemical compound within the aneurysm to stimulate cell growth within the aneurysm and close the aneurysm neck.
2. The device according to claim 1, wherein the accelerator is a threo-1-phenyl-2-decanoylamino-3-morpholino-1-propanol compound.
- 20 3. The device according to claim 2, wherein the accelerator is L-threo-1-phenyl-2-decanoylamino-3-morpholino-1-propanol (L-PDMP) and therapeutically acceptable salts thereof.
- 25 4. The device according to claim 3, wherein the L-PDMP compound stimulates the biosynthesis of glycosphingolipids (GSL)
5. The device according to claim 4, wherein the L-PDMP compound stimulates the biosynthesis of Lactosylceramide (LacCer) and glucosylceramide
30 (GlcCer).
6. The device according to claim 1, wherein the polymer is biocompatible, biodegradable, hydrophilic, and has a high degree of swelling.
- 35 7. The device according to claim 6, wherein the polymer is in a solid or highly viscous form, or is highly elastic.

8. The device according to 1, wherein the polymer comprises a hydrophilic shell and a hydrophobic core or solely consists of a hydrophilic composition.

9. The device according to claim 1, wherein the polymer is selected from the group consisting of: synthetic biodegradable polymers such as Poly (glycolic acid) (PGA), Poly (lactic acid) (PLA), Poly (lactic-co-glycolic acid) (PLGA), poly (ε-caprolactone), Polyanhydride, poly (orthoesters), polyphosphazane; biodegradable polymers from natural sources such as modified polysaccharides (cellulose, chitin, dextran) and Modified proteins (fibrin, casein); and hydrogels or superabsorbants such as Poly (ethylene oxide) (PEO), Poly (ethylene glycol) PEG, Methylacrylate (MAA), Maleic anhydride (MAH), Polyacrylamide, Poly (hydroxyethyl methacrylate), Poly (N-vinyl pyrrolidone), Poly (vinyl alcohol).

10. The device according to claim 3, wherein the L-PDMP compound is coated on 2D or 3D platinum coils.

11. The device according to claim 1, wherein the mechanically expandable device comprises a generally tubular structure having an exterior surface defined by a plurality of interconnected struts having interstitial spaces therebetween.

12. The device according to claim 11, wherein the polymer and the chemical compound are released into the aneurysm by a delivery catheter passing through the mechanically expandable device and between the struts of the mechanically expandable device proximal to the aneurysm.

13. The device according to claim 12, wherein the polymer and the chemical compound are in the form of micro-spheres, spherical, or cylindrical (with coils).

14. The device according to claim 12, wherein the delivery catheter comprises a distal compartment for securing the polymer and the chemical compound, and a proximal compartment, the distal and proximal compartments being separated by an elastic membrane, wherein pressure applied to the proximal compartment is translated to the distal compartment causing the polymer and the chemical compound to be released from the delivery catheter into the aneurysm.

15. The device according to claim 14, wherein the delivery catheter further comprises a valve to allow exit of the polymer and the chemical compound but prevents blood from entering the delivery catheter.
- 5 16. The device according to claim 1, wherein the polymer and the chemical compound are in the form of a membrane attached to the outer surface of the mechanically expandable device, such that when the mechanically expandable device is expanded, the membrane faces the aneurysm and the chemical compound is released towards the aneurysm.
- 10 17. The device according to claim 16, wherein the membrane is a single layer or comprises multiple layers.
18. The device according to claim 16, wherein the membrane is
15 biodegradable.
19. The device according to claim 16, wherein the polymer is solid or porous.
20. The device according to claim 16, wherein the polymer is amorphous or
20 semi-crystalline.
21. The device according to claim 1, further comprising radiopaque markers incorporated in the polymer to improve the visibility of the polymer and chemical compound during deployment.
- 25 22. The device according to claim 21, further comprising radiopacifiers such as barium sulphate, zirconium dioxide or iodine.
23. The device according to claim 1, wherein the mechanically expandable
30 device is biodegradable.
24. The device according to claim 23, wherein the mechanically expandable device and polymer biodegrade at different rates.
- 35 25. A method for treating an aneurysm having an aneurysm neck, the method comprising:

positioning a mechanically expandable device into a bodily vessel proximate to the aneurysm neck;

releasing a therapeutically effective amount of a chemical compound comprising a biosynthesis accelerator to stimulate cell growth within the aneurysm;

- 5 wherein the mechanically expandable device provides a support for the release of the chemical compound within the aneurysm to stimulate cell growth within the aneurysm and close the aneurysm neck.

26. The method according to claim 25, further comprising passing a delivery
10 catheter through the mechanically expandable device and between the struts of the mechanically expandable device proximal to the aneurysm, to deliver the chemical compound.

27. The method according to claim 26, further comprising mechanically
15 pushing the chemical compound from the delivery catheter and into the aneurysm.

28. The method according to claim 26, further comprising applying pressure in
a proximal compartment of the delivery catheter to cause the chemical compound
to be pushed out of a distal compartment of the delivery catheter and into the
20 aneurysm.